

Notice of Allowability

Application No.

10/720,906

Examiner

Ives Wu

Applicant(s)

JING ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 1/18/06.
2. ☒ The allowed claim(s) is/are 10, 12 and 16-19.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

(1). An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with **Attorney Philip Dahl** on January 18, 2006.

(2). The claim 12 is amended as following:

12. *(Currently Amended)* A method of making a crosslinked polymer comprising the steps of:

- a) *providing a highly fluorinated polymer comprising pending groups which include a group according to the formula $-\text{SO}_2\text{X}$, wherein each X is independently selected from F, Cl, Br, I, -OH or $-\text{O}-\text{SO}_2\text{R}^2$ wherein R^2 is an aliphatic group containing 1-18 carbon atoms which may be substituted; and*
- b) *reacting said polymer with a crosslinking agent according to the formula Ar_nR^1 , where each Ar is selected independently from aromatic groups containing 6-24 carbon or nitrogen atoms and wherein each Ar may be substituted, where R^1 is a direct bond or an aromatic or aliphatic linking group, wherein R^1 may be straight-chain, branched,*

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cyclic, heteroatomic, polymeric, halogenated, fluorinated or substituted, and where n is at least 2, to form crosslinks;

wherein said step b) of reacting said polymer with a crosslinking agent is carried out in the presence of a catalyst which is Lewis acid.

Allowable Subject Matter

(3). Claims 10,12 and 16-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

(4). ***For claim 12***, the closest prior art of the records located by Examiner is Kerres et al (US006982303B2) in which the crosslinking agent and secondary crosslinking agent is disclosed ([0007]). After-treatment is done by acidic, basic or neutral aqueous medium, there is no teaching for Lewis acid catalyst for the reaction.

(5). The 2nd closest prior art of the records located by Examiner is Mao et al (US006090895A) in which the crosslinker of the formula XSO_2RSO_2X is disclosed where X is halogen (Col.5, line 10-11), the reaction of 2nd functional group of crosslinker may be activated or augmented by addition, before or during reaction, of catalysts or initiators (Col. 5, line 33-35). There is no teaching for the Lewis acid catalyst used in the reaction. Other closest prior arts of the records located by Examiner are Yang

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(US20040241518A1) and Hedhli et al (US006872781B2) in which the reaction is without the presence of Lewis acid catalyst.

(6). **For claim 10**, the closest prior art of the records located by Examiner is Kerres et al (US006982303B2) in which the crosslinking bridge has $-\text{SO}_2\text{-Y-SO}_2-$ group, and 2nd crosslinking agent is $\text{NHR} - (\text{CH}_2)_x - \text{NHR}$, there is no disclosure of the formula Ar_nR^1 wherein R^1 is $-\text{O}-\text{R}^3-\text{O}-$, where R^3 is an aliphatic linking group containing 1-18 carbon or oxygen atoms. The 2nd closest prior art of the records located by Examiner is Mao et al (US006090895A) in which three aspects of crosslinked polymer formula are disclosed (Col. 2, line 40-59), the claimed formula by applicant is not among them. Other closest prior arts of the records located by Examiner are Yang (US20040241518A1) in which the formula of ionomeric polymer electrolyte membrane is disclosed ([0031]-[0043]), however, it is not the claimed formula by applicant.

(7). **For claims 16-19**, the pending groups $-\text{SO}_2\text{F}$ converted to $-\text{SO}_2\text{Cl}$, the closest prior arts of the records such as Kerres et al (US006982303B2), Mao et al (US006090895A), Yang (US20040241518A1) and Hedhli et al (US006872781B2) disclose the treatment of hydrolysis to convert the precursors of the cation exchange groups to cation exchange groups, there is no teaching to convert pending group $-\text{SO}_2\text{F}$ to $-\text{SO}_2\text{Cl}$ group.

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(8). As of the date of this Notice of Allowability, the Examiner has not located or identified any reference that can be used singularly or in combination with another reference including the prior art cited above to render the present invention anticipated or obvious to one of ordinary skill in the art.

(9). Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245.


The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner: Ives Wu
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Date: January 17, 2006


DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700